

Figure 1 Potential crown ethers that can be used to make ionic liquids.

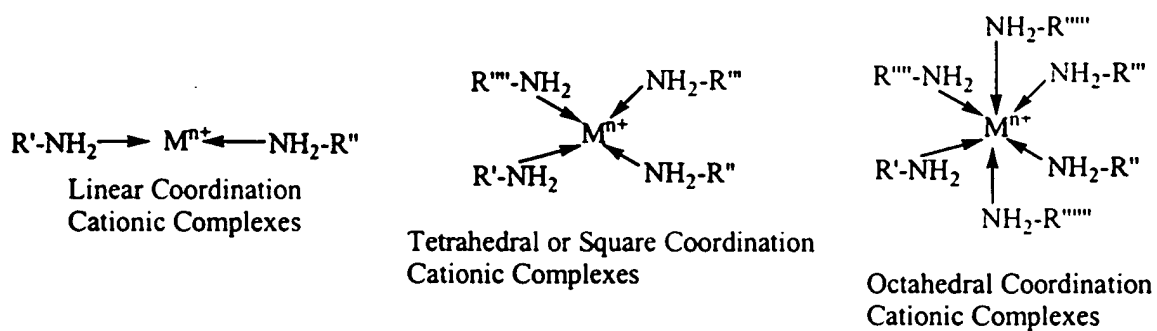


Figure 2 Structural features of the cations in new ionic liquids made by the complexation reactions of neutral amine ligands with metal ions.

Fig 3

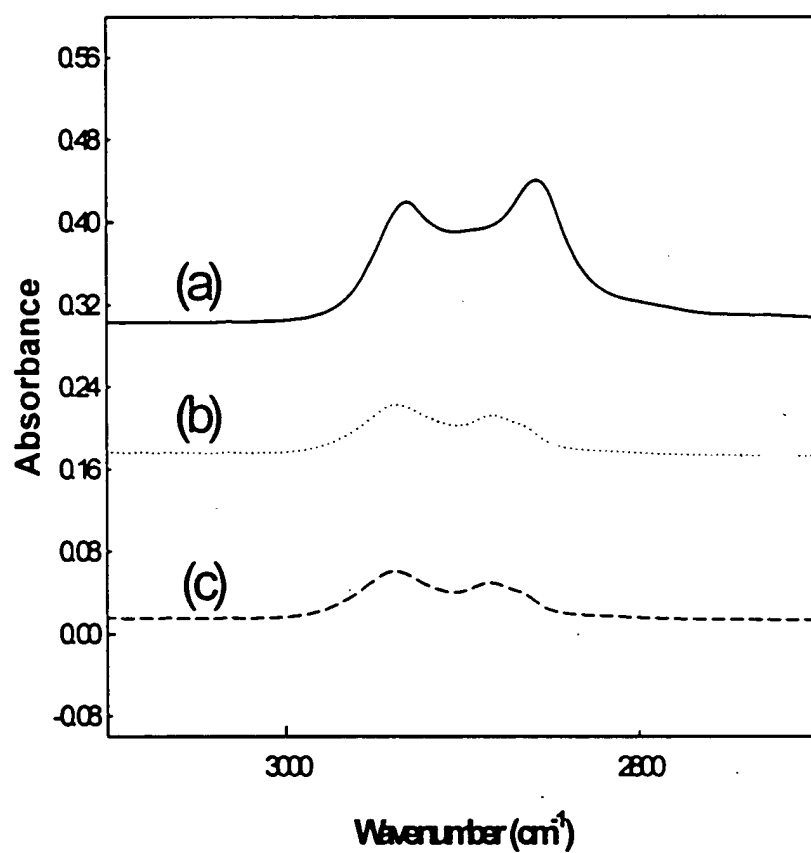


Figure Comparison of FTIR spectra of (a) pure cyclohexo-15-crown-5 and RTILs prepared with the mole ratios of cyclohexo-15-crown-5 to LiTf_2N = (b) 1:1 and (c) 1:1.35, respectively.

Fig. 7.

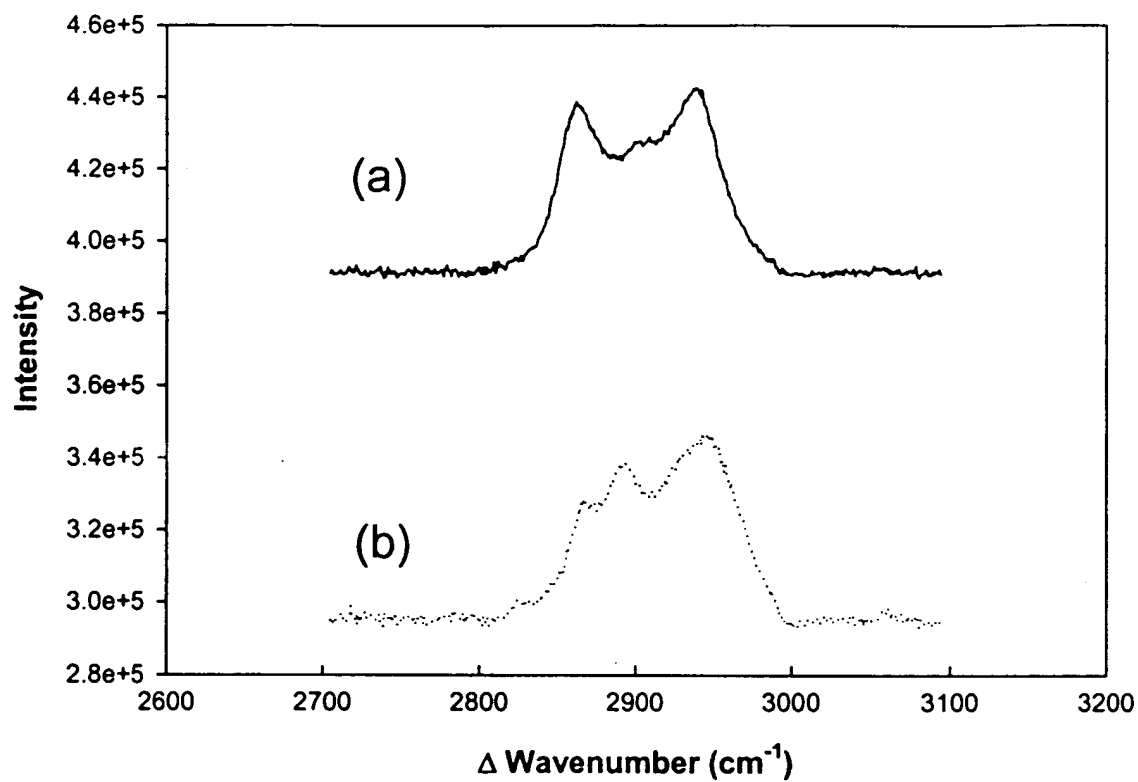


Figure. S1 Raman spectra of (a) pure cyclohexo-15-crown-5 and (b) RTIL prepared with the mole ratio of cyclohexo-15-crown-5 to $\text{LiTf}_2\text{N} = 1:1$ in C-H stretching region.

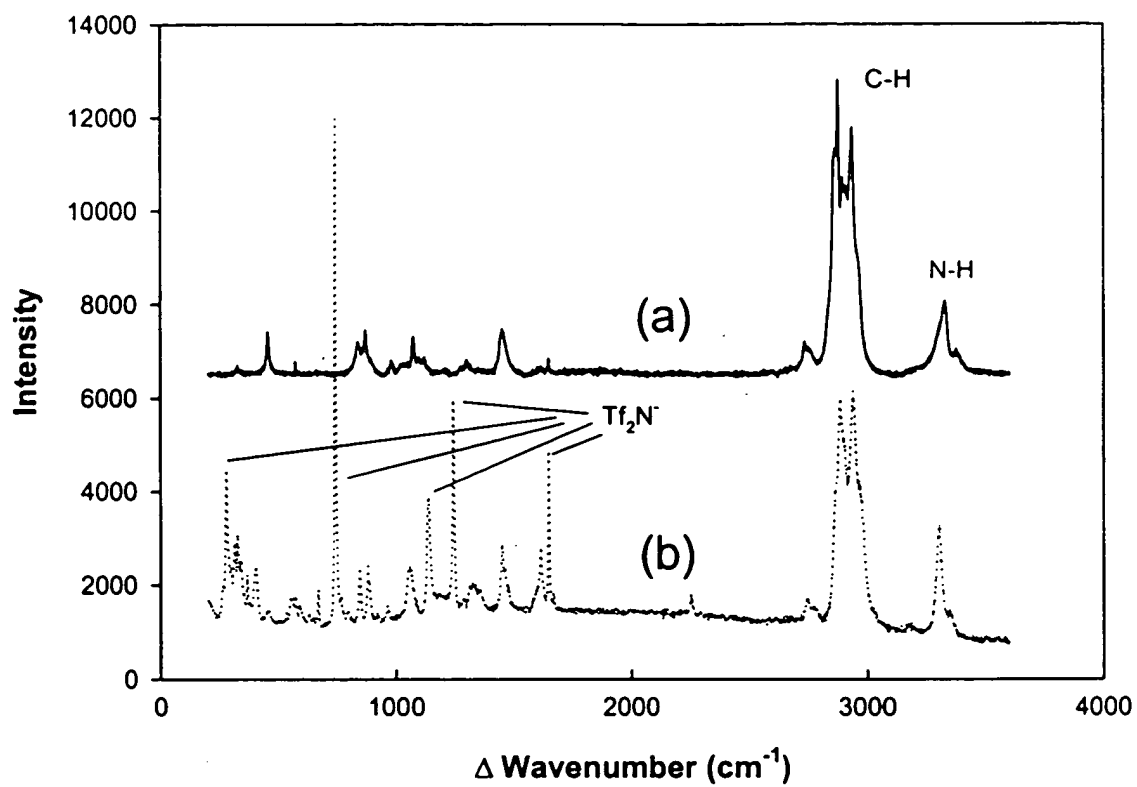


Figure 2S. Raman spectra of (a) propylamine and (b) $\text{Ag}(\text{H}_2\text{N}-\text{C}_3\text{H}_7)_2^+ \text{Tf}_2\text{N}^-$ RTIL.

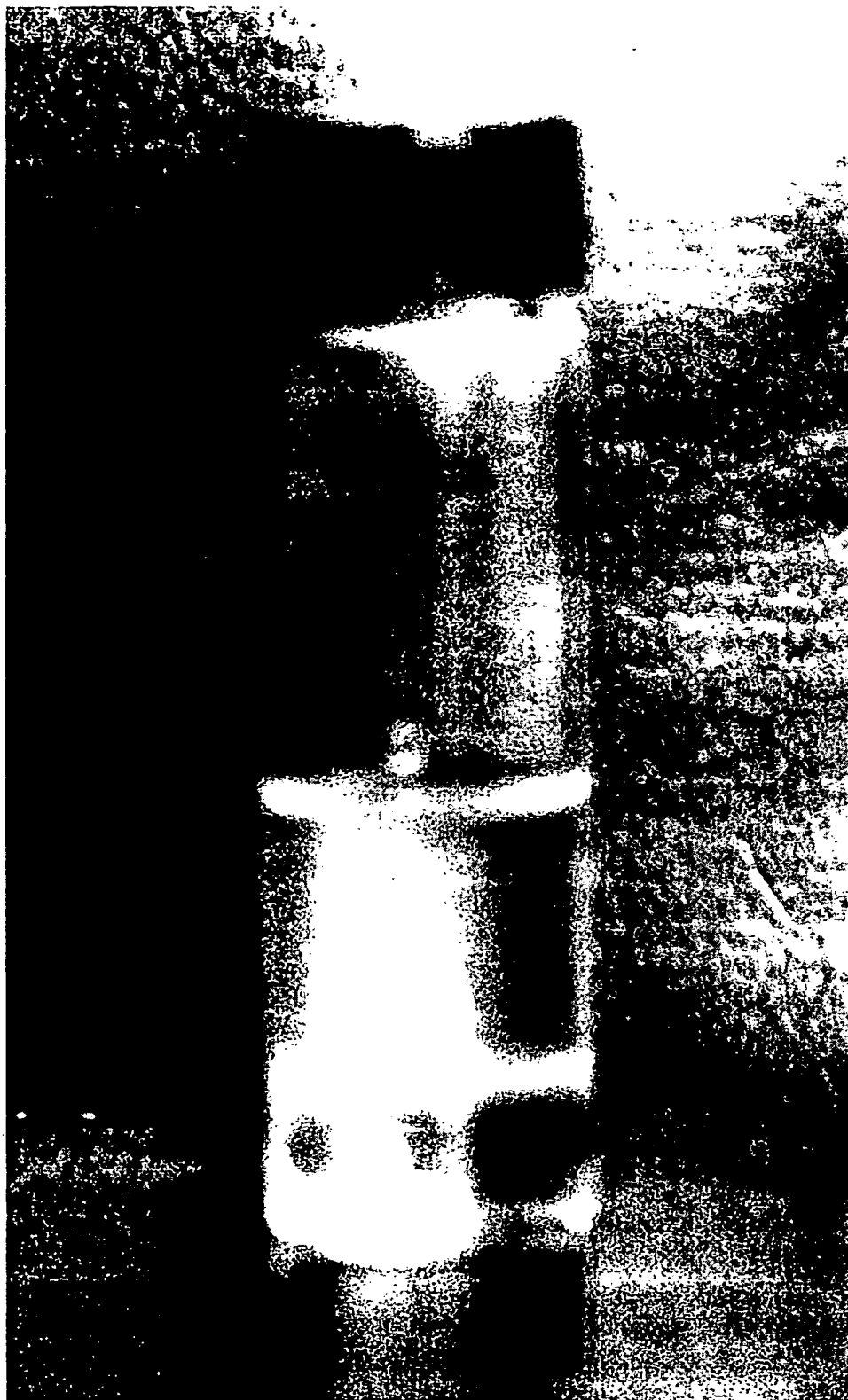


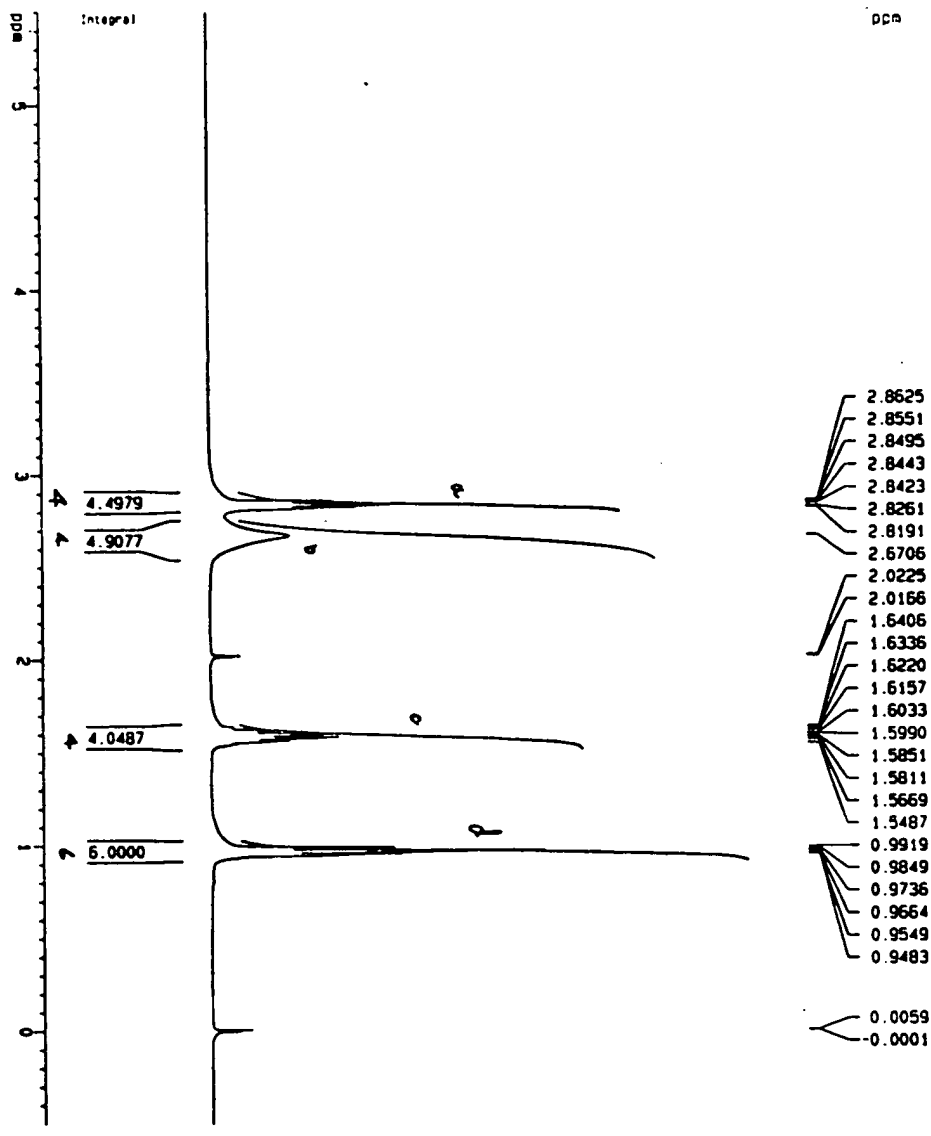
Figure 3S. Photograph picture showing phase separation of Ag(H₂N-C₃H₇)₂⁺ Tl₂N⁻ RTIL and water.

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F23 6

Ag (NH₄CH₂CH₂CH₃)₂ T₂ELN

after wash



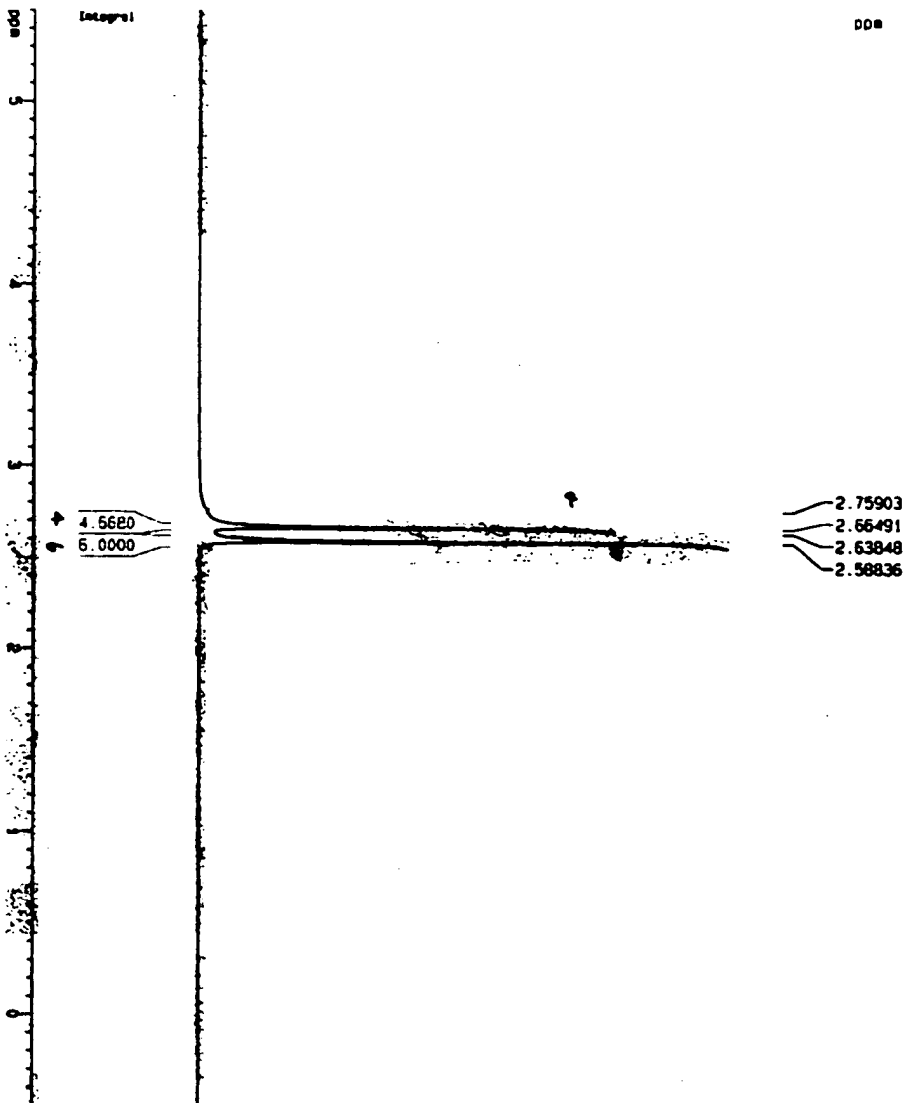
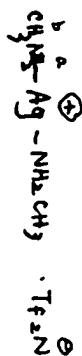
Current Data Parameters
NAME F2-18-2
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20031006
Time 12.46
INSTRUM spect
PROBHD 5 mm N/11nu
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 0
DS 0
SWH 5630.631 Hz
FIDRES 0.171633 Hz
AQ 2.0098485 sec
RG 71.8
RW 88.600 Hz
DE 8.00 Hz
TE 300.0 K
D1 2.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 6.80 Hz
PL1 0.00 dB
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 16384
SF 400.130041 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

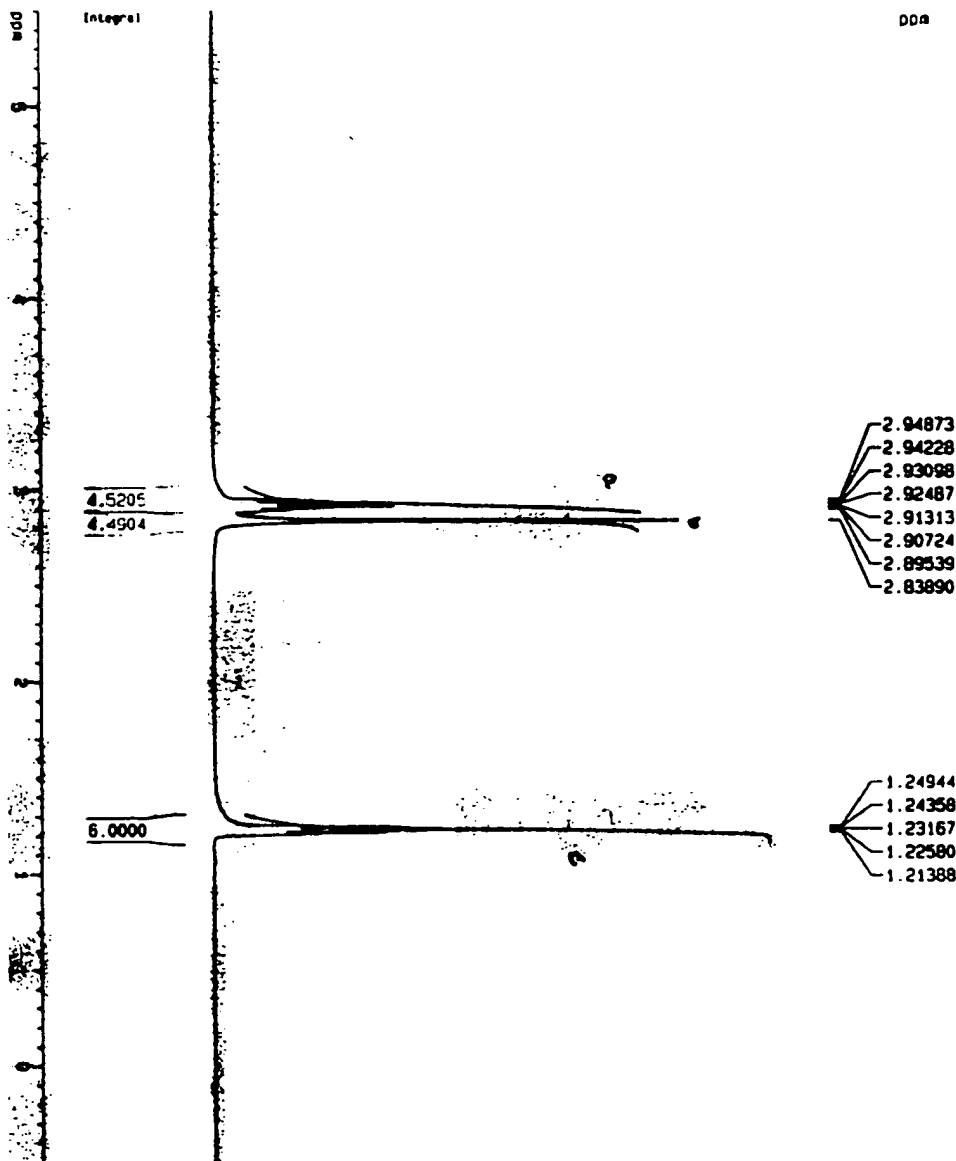
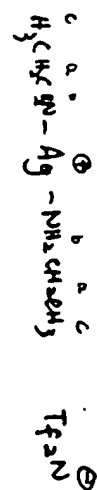
1D NMR plot parameters
CX 20.00 cm
F1P 5.500 ppm
F1 2200.72 Hz
F2P -0.500 ppm
F2 -200.16 Hz
PNUC1 0.30000 ppm/ci
NUC1 120.03900 Hz/cm

FIG 7



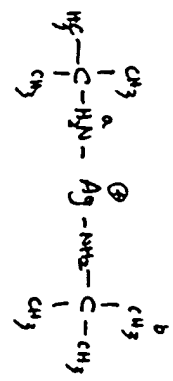
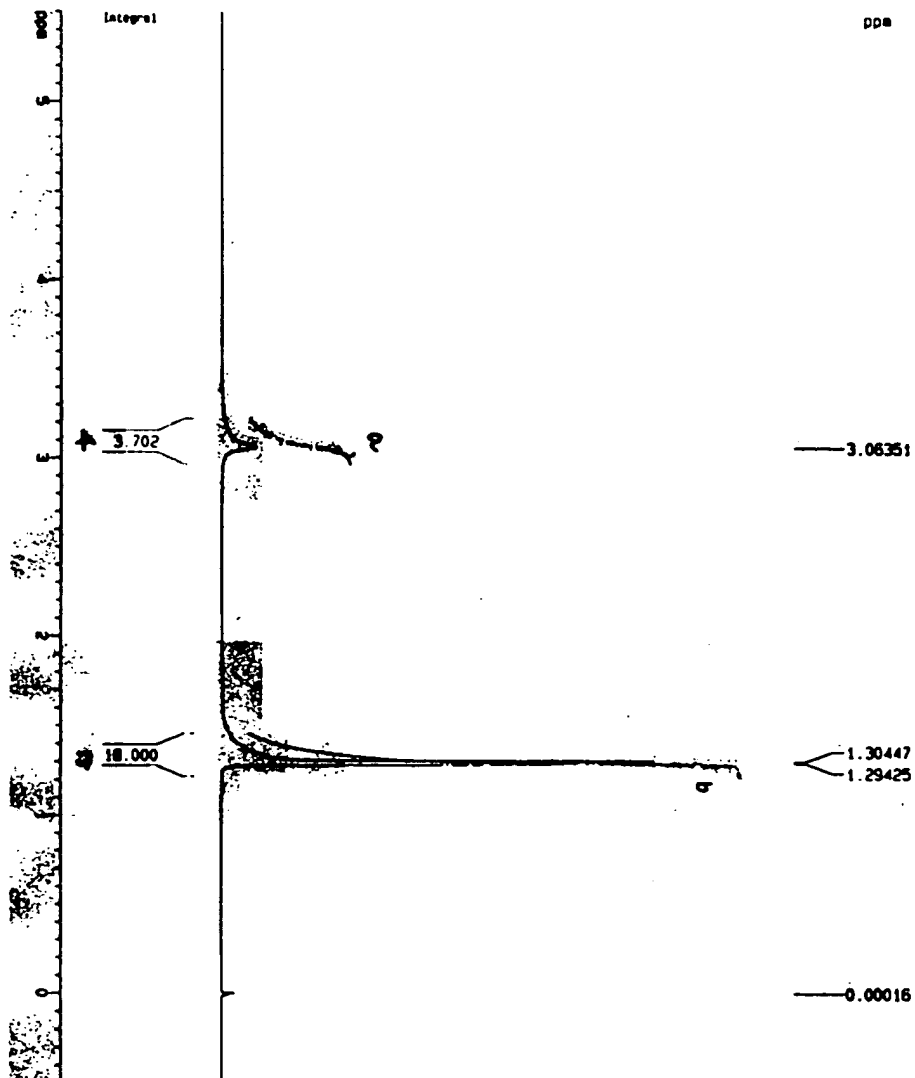
Current Data Parameters
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EXPNO: 1
PROCNO: 1
F2 - Acquisition Parameters
Date_: 20031010
Time: 9.12
INSTRUM: spect
PROBHD: 5 mm Hujllw
PULPROG: zg
TO: 32708
SOLVENT: CDCl3
NS: 8
DS: 0
SWH: 6520.831 Hz
FIDRES: 0.171623 Hz
AQ: 2.1008465 sec
RG: 7.1
OR: 66.800 umsec
OZ: 6.00 umsec
TE: 300.0 K
D1: 2.00000000 sec
Channel f1 -----
NUC1: 1H
P1: 8.00 umsec
PL1: 0.00 dB
SFO1: 400.1364718 MHz
F2 - Processing parameters
SI: 16384
SF: 400.1363808 MHz
WDW: EM
SSB: 0
LB: 0.20 Hz
GB: 0
PC: 1.00
SD: 32768
SI: 20.00 cm
FIP: 5.500 ppm
F1: 2200.72 Hz
F2P: -0.500 ppm
WZ: -200.06 Hz
FREQM: 0.30000 ppm/cm
RGCM: 120.03895 Hz/cm

F5 8



Current Data Parameters
 NAME P3-25-251
 EXPNO 1
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20031010
 Time 9.08
 INSTRUM spect
 PULPROG zgpg30
 TD 32768
 SFO1 400.1264710 MHz
 FIDRES 0.171823 Hz
 AQ 2.9528463 sec
 RG 14.3
 DQ 60.000 usec
 DE 8.00 usec
 TE 300.0 K
 D1 2.00000000 sec
 Channel f1
 NUC1 1H
 P1 9.00 usec
 PL1 0.00 dB
 SFO1 400.1264710 MHz
 F2 - Processing parameters
 SI 16384
 SF 400.1263889 MHz
 ICN 0
 SFO 0
 LB 0.30 Hz
 GB 0
 PC 1.00
 ID non plot parameters
 CX 20.00 cm
 FID 5.500 ppm
 F1 2200.72 Hz
 F2 -4.500 ppm
 F3 -200.16 Hz
 F4 0.30000 ppm/cm
 F5 120.03889 Hz/cm

Fig 9



Current Data Parameters
 NAME: P2-22-1124
 EXPNO: 1
 PROCNO: 1
 F2 - Acquisition Parameters
 Date_: 20031009
 Time: 10:41
 INSTRUM: spect
 PROBRG: 5 mm Multiple
 PULPROG: zg
 TO: 1275
 SOLVENT: CDCl3
 NS: 8
 DS: 0
 SWH: 5000.631 Hz
 FIDRES: 0.171620 Hz
 AQ: 2.500425 sec
 RG: 39.5
 DB: 60.820 Hz
 DE: 6.00 Hz
 TE: 300.2 K
 D1: 2.00000000 sec
 ===== CHANNEL f1 =====
 NUC1: 1H
 P1: 0.80 usec
 PL1: 0.00 dB
 SFO1: 400.1364710 MHz
 F2 - Processing parameters
 SI: 16384
 SF: 400.1364710 MHz
 DS: 0
 SSF: 0
 LB: 0.30 Hz
 GB: 0
 PC: 1.00
 ID: 1000000000
 CI: 20.00 cm
 FIP: 5.500 ppm
 FI: 2200.72 Hz
 F2P: -0.500 ppm
 F2: -500.00 Hz
 FREQM: 0.30000 ppm/cm
 NDCM: 120.03500 Hz/cm

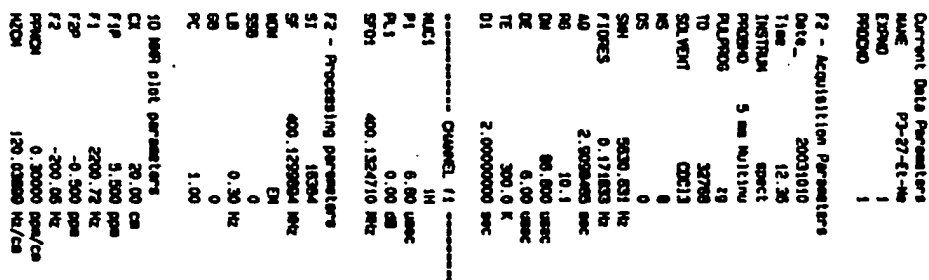
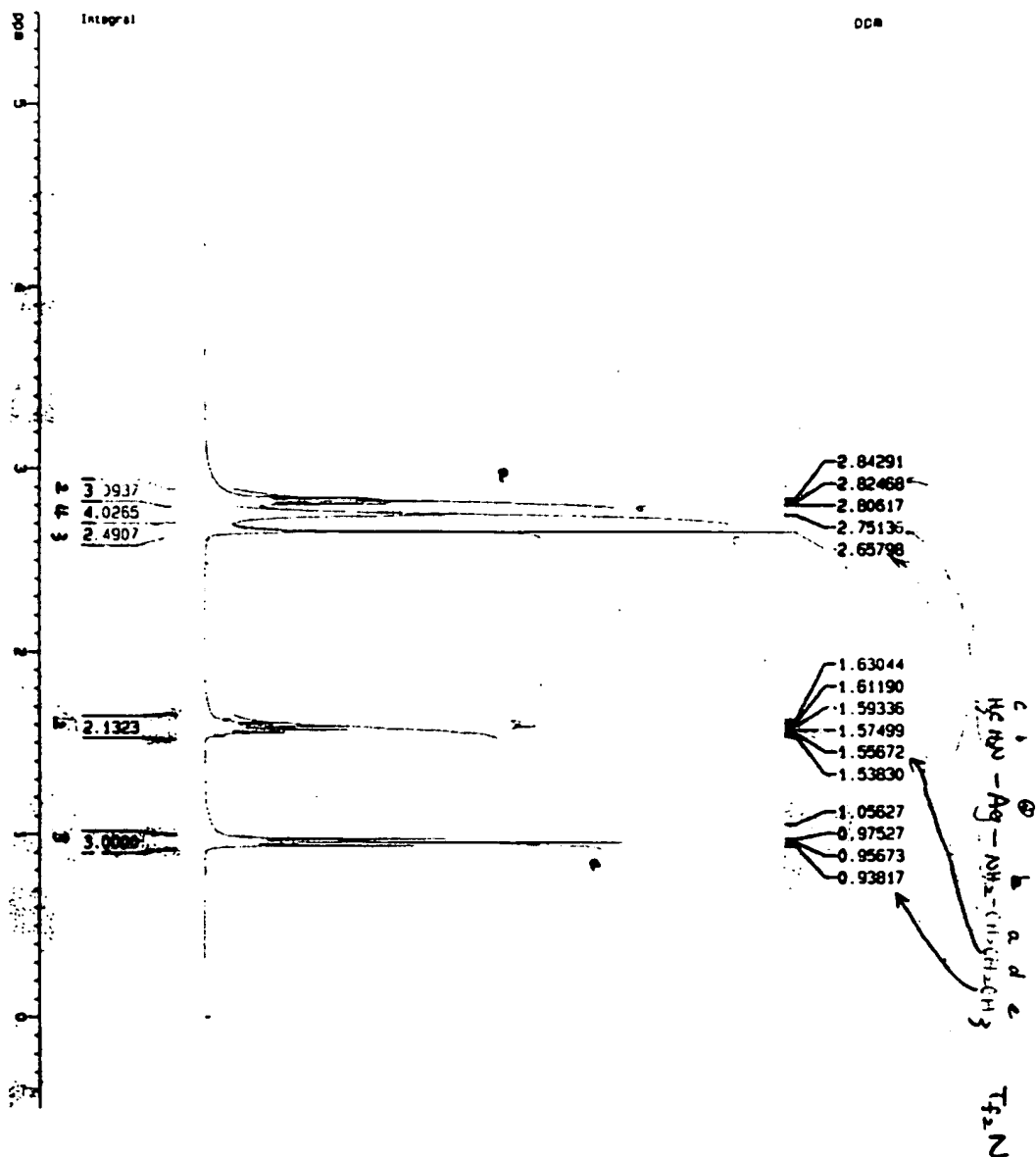
$$\begin{array}{c} \text{c} \quad \text{b} \quad \text{a} \quad \text{d} \\ \text{CH}_3\text{NH}_2 - \text{Ag} - \text{NH}_2\text{CH}_2\text{CH}_3 \end{array} \quad \text{Tf}_2\text{N}^-$$


Fig 11



Current Data Parameters
 Name: F2-26-01-10
 ExpNo: 1
 PROCNO: 1

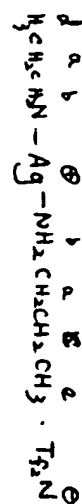
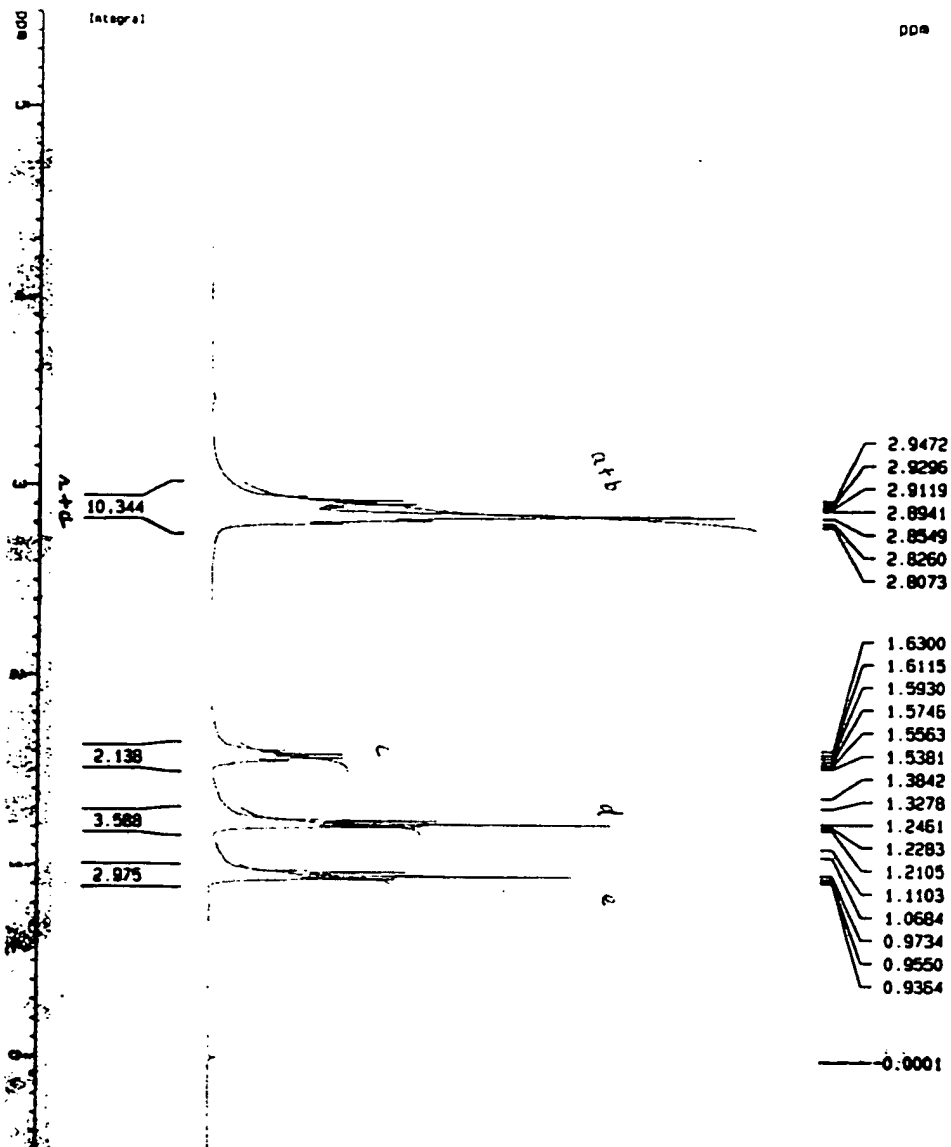
F2 - Acquisition Parameters
 Date_: 20031010
 Time: 11.27
 INSTRUM: spect
 PROCNO: 5
 PULPROG: zgpg30
 TD: 65536
 SFO: 400.146
 AQ: 0.171633
 FIDRES: 0.171633
 AQ: 0.171633
 RG: 327.68
 DQ: 0.000000
 DE: 0.000000
 TE: 300.2 K
 O1: 2.00000000 sec

===== CHANNEL f1 =====
 NUC1: 1H
 P1: 0.000000
 PL1: 0.00 dB
 SFO1: 400.1460710 MHz

F2 - Processing parameters
 SI: 32768
 SF: 400.1460710 MHz
 RG: 327.68
 DQ: 0.000000
 DE: 0.000000
 TE: 300.2 K
 O1: 2.00000000 sec

1D 1H plot parameters
 SI: 32768
 SF: 400.1460710 MHz
 RG: 327.68
 DQ: 0.000000
 DE: 0.000000
 TE: 300.2 K
 O1: 2.00000000 sec

Fig 13



Current Data Parameters

NAME	PS-21-1728
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20031009
Time	0.32
INSTRUM	spect
PROBHD	5 mm Buj11nu
PULPROG	zg
TD	32768
SOLVENT	CDCl3
NS	8
DS	0
SWH	5830.631 Hz
FIDRES	0.17633 Hz
AQ	2.000465 sec
RG	14.3
DA	60.800 usec
DE	6.00 usec
TE	300.0 K
SI	2.00000000 sec

Channel f1

MULTI	1H
P1	8.00 usec
PL1	0.00 dB
SFO1	400.1264710 MHz

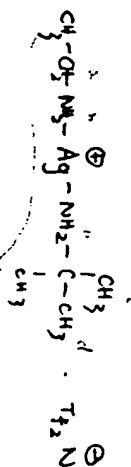
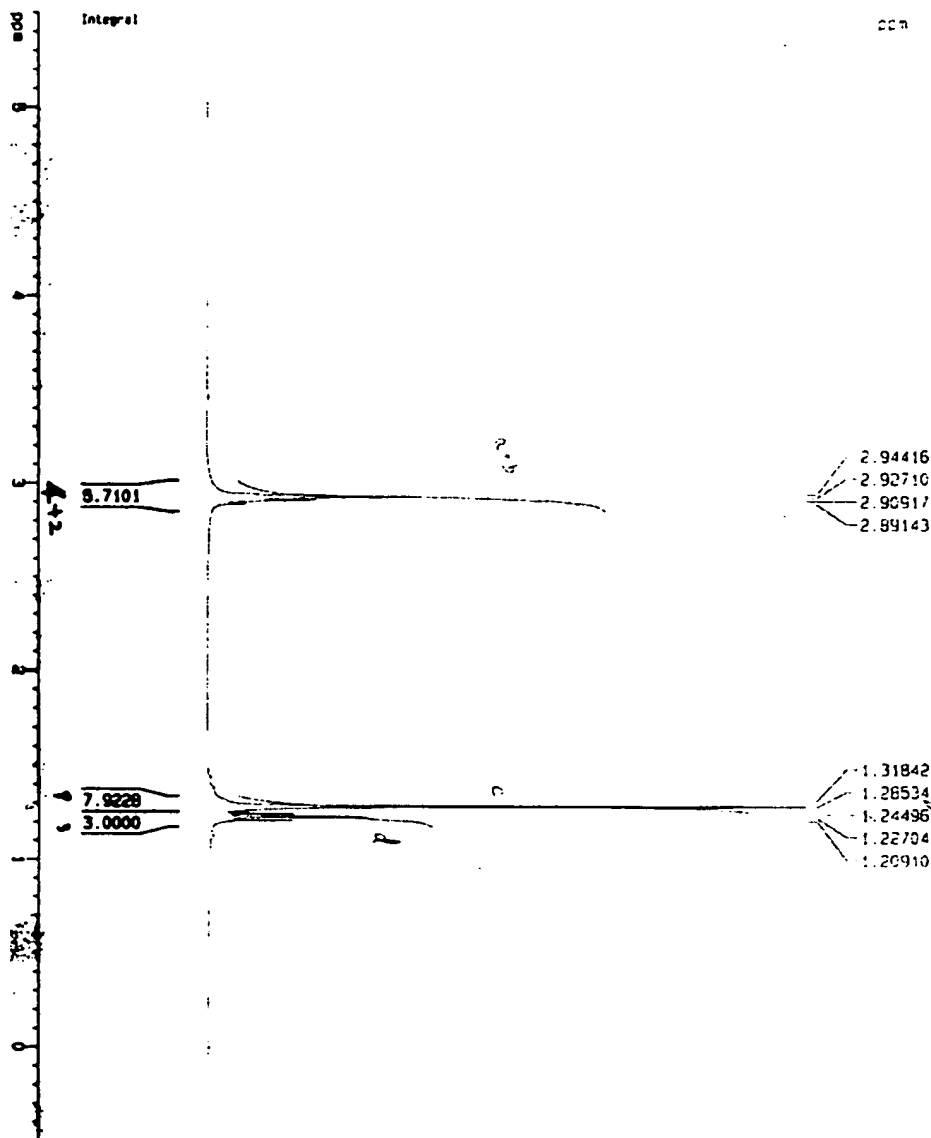
F2 - Processing parameters

SI	16384
SP	400.126029 MHz
NUC1	D1
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

10 MHz plot parameters

CH	20.00 cm
F1P	5.500 ppm
F1	2200.72 Hz
F2P	-0.500 ppm
F2	-200.06 Hz
PROCN	0.30000 ppm/cm
PCN	180.03500 Hz/cm

Fig 14



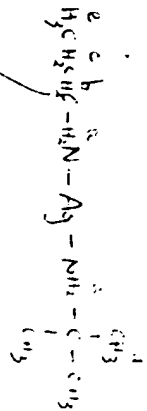
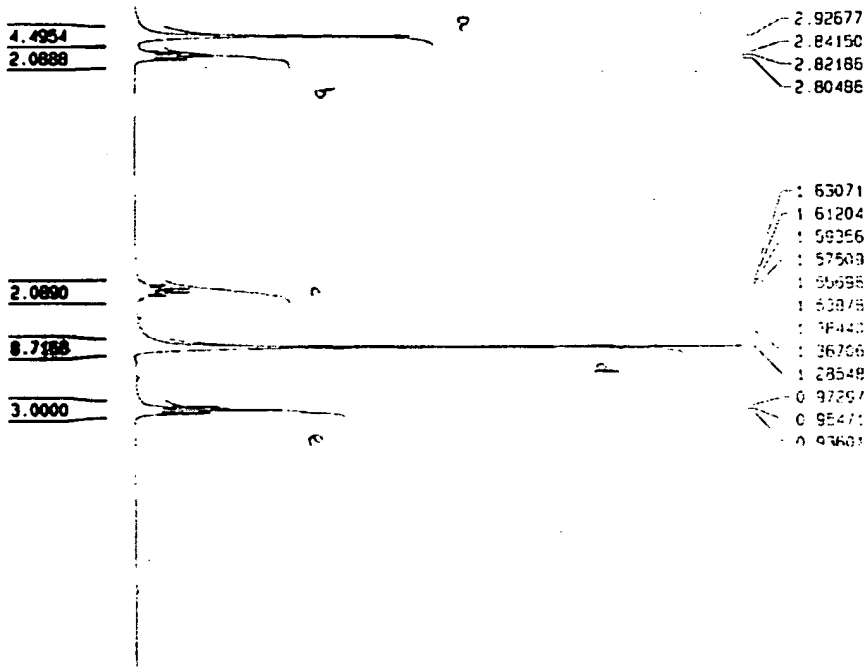
Current Data Parameters
NAME: P1-21-18-11
EXPNO: 1
PROCNO: 1
Date_: 20031010
Time: 11:22
INSTRUM: spect
PROBHD: 5 mm BBI-1H
PULPROG: zgpg30
TD: 32768
SOLVENT: DMS-D6
NS: 8
DS: 0
SWH: 5620.831 Hz
FIDRES: 0.171633 Hz
AQ: 2.0096460 sec
RG: 11.3
DQ: 0.0000000 sec
DE: 6.00 uV
TE: 300.0 K
D1: 2.00000000 sec

===== Channel f1 =====
NUC1: 1H
P1: 9.00 uV
PL1: 0.00 dB
SFO1: 400.1264710 MHz

F2 - Processing parameters
SI: 16384
SF: 400.125897 MHz
WDW: EM
SSB: 0
LB: 0.30 Hz
GB: 0
PC: 1.00

1D 1600 plot parameters
CX: 20.00 cm
FID: 9.500 ppm
F1: 8200.72 Hz
F2: -0.500 ppm
F3: -200.00 Hz
FREQ1: 0.30000 ppm/cm
KOH1: 120.00000 Hz/cm

03π



Current Data Parameters		F2 - Acquisition Parameters	
NAME	P3-24-18-00	NAME	
EXPNO	1	Date_	20031010
PROCNO	1	Time	9.18
		INSTRUM	spect
		PROBHD	5 mm Nal/1Hnu
		PULPROG	zgpg30
		TD	32768
		SF	300.13
		SOLVENT	DMS
		NS	0
		DS	0
		SWH	5000.031 Hz
		F2FREQ	0.171633 Hz
		RG	2.592646 sec
		NUC1	1H
		NUC2	13C
		DE	60.000 usec
		TE	300.0 K
		01	2.00000000 sec
Channel: f1			
NAME	IN		
P1	0.10 sec		
PUL	400.1324710 Hz		
SWH	400.1324710 Hz		
F2 - Processing parameters			
SI	13264		
WDW	EM		
SSB	0		
LB	0.30 Hz		
GB	0		
PC	1.00		
10 MHz plot parameters			
CF	50.00 cm		
F1P	5.000 ppm		
F1	2200.72 Hz		
F2P	-0.500 ppm		
F2	-200.00 Hz		
PCPD1	0.20000 ppm/cm		
PCPD2	120.00000 Hz/cm		

Fig 16

C-13 NMR spectrum of $\text{Ag}(\text{H}_2\text{N}-\text{C}_3\text{H}_7)_2^+ \text{ Tf}_2\text{N}^-$ RTIL.

